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SEQUENCING THE FLOW OF DEPLOYING FORCES: THE OPERATIONAL RISK IN AN EXPEDITIONARY ENVIRONMENT

By

Lucian L. Niemeyer
Major, United States Air Force

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Abstract
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Abstract

SEQUENCING THE FLOW OF DEPLOYING FORCES: THE OPERATIONAL RISK IN AN EXPEDITIONARY ENVIRONMENT

Combat operations in the 21st century requires highly responsive and agile forces with capabilities tailored to meet the needs of a Joint Force Commander. These capabilities must be ready at the right place at the right time to meet operational objectives. They must be delivered with maximum efficiency in the smallest footprint with the least amount of "tail" to preserve limited resources. To ensure an efficient deployment of combat power, priorities are established and risk is incurred in the development of a sequence for arriving combat and support forces. Operational planning staffs determine this sequence using their Commander's intent, an estimate of the situation, and risk management.

During a crisis response, planners must make extremely quick assessments and assumptions concerning operating locations, local conditions, and required support functions to develop proposed courses of action for the Commander. Acting on these assumptions and determining the subsequent sequence of deployment by functions incur operational risk to forces, deployment efficiency, and the eventual effectiveness of a selected course of action.

Operational planners must have a comprehensive picture of the operational area and a high degree of functional expertise in order to accurately assess the risk of sequencing combat forces in relation to combat support elements. Combat support functions enable combat power. Deploying tooth at the expense of tail risks degradation of total combat power capability and an increase of deployment inefficiency.

Preface

The topic for this paper was inspired by leaders embroiled in current events and the daily effort to support combat power and national interests in the Afghanistan AOR. They are facing the same challenges and obstacles that have been overcome in every U.S. deployment since the Gulf War.

No issue or comment in this paper should be implied to be a failure or criticism of operational planning staffs at any level of Service. This paper is intended only to raise the issue of risk management with the goal of improving operational efficiency. While the paper centers on combat support for air operations, lessons learned and recommendations can be applied to the forward deployment of forces in all Services. My research has revealed that the concerns of sequencing forces deployed to forward locations are more prevalent in the Air Force and Army where tough decisions have to be made about priorities in consideration of timing for combat power deployment and the limited amount of strategic airlift. U.S. Navy and Marine combat support elements benefit from consolidation afloat and movement en masse to a forward location.

For security purposes and host nation sensitivities, I do not specify locations in the account of incidents affecting current operations. Many of the details including operational impacts are classified. Therefore, in order to preserve an unclassified paper, I can only provide the general nature of the incidents.

I am indebted to members of the U.S. Air Force Civil Engineering Contingency Cell, the U.S Navy N-4, and U.S. Chairman of the Joint Chiefs J-4 staff for allowing me the opportunity to hear their perspectives, despite the extremely intense operations tempo they are experiencing.

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Introduction

> *"The more you looked, the more appalled you were by what you saw. There were already thousands of American troops on the ground, standing, sitting, or milling around. Every few minutes another transport plane would arrive, pouring hundreds more soldiers into ever-denser knots around the runway. Shelter from the blazing sun was almost impossible to find, and in the few places where a building or aircraft threw off some shade, soldiers jockeyed for position. There was no logistical structure in place to receive incoming units. It was approximately 140 degrees. The troops were confused, tired and irritable. …Whatever else happened, they would need water, food and shelter very soon."* [1]

CINCCENT responded in the first days of Operation DESERT SHIELD with a course of action intended to deter and defend against an Iraqi attack into Saudi Arabia. The objective was to quickly set a trip wire of iron on runways and shooters in the way of Iraqi armored columns, weighing the operational risks of mismatched forces and lack of combat support against the risk of losing crucial ports and infrastructure. The 82nd Airborne began arriving in Dhahran the day after the deployment order. Air Force F-15s also arrived in country on the same day to start air patrols. Despite the confusion, as we now know, it worked.

It worked because we had the most lethal military force in the world, extensive support from our host nation, and an extremely cooperative enemy, who either had no intentions for Saudi Arabia or whose military incompetence precluded another Task Force Smith. Much analysis has been conducted in the last ten years over the first two weeks of Desert Shield, concluding that the commander's estimate of the situation drove the initial sequence and types of forces deployed. But, should the quick, decisive deployment of substantial tooth with minimal sustaining tail serve as a model course of action to pursue in the face of an aggressive enemy?

> *"The basic problem we were dealing with was that we were trying to set up a logistical structure for reception in the middle of a deployment. According to doctrine and common sense, you set up the structure first and only then do you begin the deployment."*[2]

[1] MG Pagonis at King Abdul Aziz AB in Dhahran on 9 August 1990. William Pagonis, Moving Mountains – Lessons in Leadership and Logistics from the Gulf War (Boston: Harvard Business School Press, 1992), 85.
[2] Ibid, 87

Will "tooth first" continue to be an effective deterrent to an adversary with knowledge of our capabilities, an assessment of our vulnerabilities, and the will to act upon both? Would our soldiers and airmen have been able to sustain a fight without the flexibility, maneuverability, and combat support they were trained to rely on?[3] Should planners continue to count on the ingenuity of field leadership and the continued unwavering dedication of our personnel to ensure success in every mission despite substantial obstacles?

A leaner, more lethal force structure emerged from the Gulf. Revised logistical processes for reach-back, pre-positioning, tailored forward presence, and increased contractor support has preserved vital air and sea lift. Services have transformed concepts of employment to reduce their weight and footprint, emphasizing the responsiveness and flexibility of expeditionary structures. U.S. Army and Air Forces now strive for combat power available to the war-fighting CINC by ninety-six and forty-eight hours respectively, assuming strategic airlift support. The goal continues to be getting shooters forward as quickly as possible, with combat support to follow as is possible with available lift. Unfortunately, lessons clearly identified in Desert Shield continue anew in the muddy fields of Bosnia, Albania, and Uzbekistan.

> *"People in the field make this look easier than it really was, because it was not easy. I'm sure one day there will be thousands of vignettes told" about the extreme measures and improvisations that went into Enduring Freedom…Officials were forced to be innovative to meet taskings "on a very accelerated timeline – often before [expected] support was in place."*[4]

Were we deploying in Enduring Freedom to deter an imminent attack? All missions call for risk and sacrifice to quickly respond with overwhelming and decisive combat power. But,

[3] "In Desert Shield, inability to surge mobile forces en masse was our most insurmountable obstacle. Even with host nation support, the absence of firm support agreements complicated planning. It placed U.S. and other coalition combat forces at risk when deployed without the full complement of their organic and supporting logistical organizations. The early decision to deploy shooters constrained the effective establishment and ongoing support of the theater logistics structure." - Douglas W. Craft, An Operational Analysis of the Persian Gulf War (U.S. Army War College, Carlisle PA: Strategic Studies Institute, 1992), p 20.

should challenges and obstacles be imposed by the enemy, external conditions, and the fog of war, not by a commander's estimate or friendly planning staffs? Every contingency situation does not dictate a course of action requiring improvisation and extreme measures, putting forces and equipment at risk. Eventually, a skilled enemy will exploit this vulnerability.

This paper addresses the question: **What is the operational risk of deploying and employing combat power at a secure expeditionary location before critical support functions are deployed?** Military history is replete with lessons and implications from insufficient logistical support for weapons, petroleum, spare parts, and ammunition**. This paper uses lessons learned in the functions of military engineers as examples to illustrate the risks inherent in omitting even less obvious support functions from the initial deployment**. I conclude with recommendations to decrease the degree of risk in initial decisions concerning locations and deployments. My **thesis** is that **planning staffs must conduct a comprehensive risk assessment across all functional areas in the determination of courses of action in order for the commander to understand potential impact to forces and missions caused by deployment prioritization**. Why the Engineering function? It represents a key enabler for flexibility and sustainment across all Services and all types of operations. Military engineers also historically have been used across all phases of conflict from pre-deployment to engagement to post hostilities reconstruction.

This paper is written for CINC and component planning staffs not with the intention of dictating a sequence of force flow into an expeditionary location, but with the goal of addressing risk associated with the sequencing of forces. Hopefully, it provides a contribution to risk assessment associated with prioritization of function and capabilities, resulting in

[4]Lt Gen Michael Zettler quoted by Adam Hebert, "USAF Quickly Invented A Plan to Support Operation Enduring Freedom" Inside the Air Force, 25 January 2002, 9.

delineations of safer courses of action in the first time-critical, task-saturated days of crisis response planning.

> "In determining what constituted a "balanced force" there was much opportunity for disagreement. Ground, air, and service branches inevitably competed for what each regarded as its rightful portion of the troop basis. …. Only 11.8% of the 1942 Army troop basis had been allotted for service troops,…. Of the total AEF force of nearly two million men in France at the end of WWI, 34 % were service troops. But in the Spring of 1942 few trained service troops were available for duty in overseas theaters and *service troops beyond all others* were required first in the United Kingdom. It was imperative that they ***precede combat units*** in order to receive equipment and supplies, prepare depots and other accommodations, and provide essential services for the units which followed"
> - R.G. Ruppenthal, Logistical Support of the Armies, Volume 1, Office of the Chief of Military History, Department of the Army, (Washington D.C 1953) 57

Operational Risk in Deployments

Defining risk as both the probability and severity of loss linked to hazards, risk management in force deployment decisions does not impose the possibility of ultimate mission failure. Risk assessment in this case focuses on a lesser degree of severity: the probabilities of an increase in the time needed to employ power; the sacrifice of flexibility; and an increased threat of loss of life or injury. In deployment planning, two areas of risk are analyzed: the selection of secure operating locations and the sequence of forces to arrive at that location, both affecting the initial operating capability date. Operational risk incurred within a selected course of action can be compounded by a risk of faulty assumptions stemming from partial information leading to the selection. Thus, unforeseen conditions or inadequate crisis planning magnify the risk inherent in deployment sequencing.

An emerging area of substantial risk in operational planning concerns commanders' liability for adherence to environmental laws[5] and the principle of vicarious liability.[6] The complexity

[5] Per doctrine, Joint operations "are expected to be planned with appropriate consideration of the environment", Joint Chiefs of Staff, Joint Operations, Joint Pub 3.0 (Washington DC: 10 September 2001), III-33. Guidance to Joint Forces commanders on environmental liability is also found in Joint Deployment and Redeployment Operations, Joint Pub 3.35 (Washington DC: 7 September 1999), III-15 and Joint Doctrine for Civil Engineering Support, Joint Pub 4.04 (Washington DC, 26 September 1995), II-7

of these issues necessitates a high degree of training and expertise on operational planning staffs to be able to assess repercussions in the development of comprehensive courses of action for the commander. Field expertise for the commander for compliance with regulations and laws remains in the functional combat support elements, which may or may not be deployed with the initial forces. Therefore, planning staffs may intentionally or unintentionally increase a commander's liability risk through sequencing decisions. Deployment planning should include at all levels an understanding and accurate risk assessment of exactly what legal hazards exist and the processes and functions in place to mitigate them.

Ultimately, risk management should not inhibit commanders' flexibility and initiative, nor expect to remove risk altogether from a course of action. But, an increasing possibility exists in the demand for efficient operations that an incident as minor to the ultimate mission as the siting of a force beddown in a swamp or the loss of an aircraft due to a failed runway repair will receive a disproportionate amount of air time on CNN, requiring a disproportionate amount to resources to respond to and correct the problem. The degree of explanation may be compounded by the presence of policy, procedures, and processes, combined with access to resources that would have prevented the incident. Add economic conditions marked by demand for preservation and management of resources in a fiscally constrained environment, and the commander's assessment of risk migrates from mission success or failure to what potential consequences lurk in deployment and execution actions that may snowball into distractions from crucial events and detractions from mission success.

"It is a question of how much risk and how much hardship the commander is willing to impose on his subordinate forces and personnel in order to gain an objective. There are no absolute or arbitrary limits. The decision involves a process of selection of courses of action, and of the development of plans that will make the most effective use of the combat forces and logistical resources which are available. This process is the highest test of military judgment. It requires close personnel relationships among the commander and his responsible assistants." - ADM Henry Eccles, Logistics in the National Defense, 80

The Role of Military Engineers

Military engineers have operated in expeditionary environments to enable combat power since the days of Roman legions. More recently, engineers provided critical support during WWII, building expedient piers on Normandy's shores to clearing one end of a south Pacific airfield while Marines battled the enemy to secure the other end. In every major U.S. conflict since WWII, military engineer's ingenuity and perseverance overcoming obstacles to enable the employment of combat power has been cited by generals and historians alike as an integral part of strategic and operational success. Engineering support of air operations has evolved from the clearing a grass strip into a multitude of functions (Illustration 1, page 27) intended to improve operational flexibility, protect resources and sustain the effective employment of soldiers and fires. These roles are accentuated in an expeditionary environment where increased flexibility is required to adjust to demanding and dynamic mission requirements.

Military engineers in DESERT SHIELD played a major role in expanding the infrastructure to support U.S. and coalition force deployment and eventually operational maneuver. Over eight million square feet of airfield pavement and 4,800 facilities were constructed to bed down 1,200 aircraft. In addition, a 5,000-person air base was built from the ground up in 40 days.[7]

Currently in ENDURING FREEDOM, Air Force engineers are accomplishing similar tasks in a less developed part of the world. In Afghanistan and nine neighboring countries, they have established or expanded existing tent cities at thirteen locations. At the same time, they have repaired or established airfields at 10 of the locations. At two regional hubs selected by CENTCOM planners, engineers are building major aircraft parking ramps, while other teams are widening taxiways, building contingency parking ramps, and assembling 550-man tent

[7] Department of the Air Force. Gulf War Air Power Survey, Volume III - Logistics and Support (Washington, DC: 1993) ,442

cities for troop beddowns. Other projects include building fire stations, aircraft hangars, vehicle search areas and helicopter pads, paving roads, accomplishing rapid runway repairs.

Typically, Air Force engineering tasks can be divided into three basic categories of objectives within combat support: force protection, force sustainment, and operational maneuver/flexibility. Contingency response planners in the initial stages of planning consult previously prepared airfield surveys conducted by cross functional Air Force team or databases to determine existing conditions of a proposed location and the requirements for combat support functions. If enough time is given between the deployment order and the expected arrival of combat aircraft, specialized pre-deployment functions such as the Tanker/Airlift Control Elements (TALCE), advance teams from the deploying AEF, or newly formed units like the 86th Contingency Response Group from Ramstein AB Germany[8] can be deployed as the first forces on the ground to assist with planning and reception actions. Engineering functions such as fire fighting/rescue, explosive ordnance disposal, chemical/biological protection, and runway repair are critical to the initiation of base operations and should, if at all possible, precede the arrival of combat forces. These functions should be in place before the first airlift assets arrive with the initial forces in the deployment, since a runway damaged by an arrival of a C-17 will curtail any further airlift or combat aircraft deployment or operations, thus jeopardizing the timing of force closure. *"Determining when logistical elements should be mobilized is based on the concept of employment for combat forces they will support. This might require that logistical forces be mobilized* ***at the same time or even before combat forces***." (Bold print in original) [9]

[8] Established in 2000 to specifically address the need for a multifunctional initial quick deployment force to an austere location with an unknown threat environment. (wwwmil.usafe.mil/bases/ramstein/86crg)

Factors Determining the Sequencing of Deployment for Engineers

Military planners at both the CINC and component staffs consider many factors and make assumptions within a very compressed time period to develop courses of action for the employment of forces and the deployment sequencing of functions:

1. Commander's Intent (objectives, locations, end state, direction)
2. Concept of operations (phasing, timing, required forces)
3. Threat conditions and intelligence
4. Date for Initial Operating Capability for the application of combat effects
5. Available resources (pre-positioned assets, host nation support, coalition support)
6. Logistics (access, lines of communication, force sustainment)
7. Environmental conditions at selected locations

An important deployment consideration is the situation at the selected location. A forceful entry and neutralization will demand full combat power. In most deployment planning scenarios with strategic airlift on the ground, the immediate security of the location has already been established. Subsequent prioritization processes analyze force protection requirements, force sustainment, and local conditions to determine the sequence for engineering functions deployment. In DESERT SHIELD a mature theater with existing infrastructure to receive and sustain the force, plus an availability of contracted services and host nation support reduced the risk of deploying combat power before support elements. But, even in this friendly and robust environment, lessons emerged about the impact of the prioritization of function on operational efficiency.[10] Subsequent operations in Bosnia, Kosovo and now Afghanistan, as well as numerous other crisis response/humanitarian operations, have generated a continuous stream of

[9] Joint Chiefs of Staff. Doctrine for Logistic Support of Joint Operations, Joint Pub 4-0 (Washington DC: 6 April 2000), II-5

[10] Lt Gen Horner JFACC "Initially, our biggest problems from a logistics standpoint were munitions, fuels, and bare base…but these were caused by the speed with which our fighter units deployed. We began the deployment under the auspices of one plan, …within the first day we switched to a second plan...and then abandoned all previously developed contingency plans and constructed one as we went along." Gulf War Air Power Survey, 221

lessons learned about poor site selection, deployment inefficiencies, and operational vulnerabilities incurred by an incomplete pre-deployment assessment or a lack of adequate support functions to respond to different or changing site conditions.

Lessons Learned from Sequencing of Deployments

Lessons were drawn from database searches of past operations and interviews with staff functions involved with current operations to ascertain trends that might be of assistance for planners in future operations. In these lessons field leadership noted local challenges and conditions not applicable in all operations. Most of these operations benefited from some degree of deliberate planning (defined as planning accomplished more than 5 days before D-day) more advanced that that allotted planners for DESERT SHIELD. Most were conducted in less mature theaters than Southwest Asia. These operations also were conducted without the threat of imminent attack by a substantial enemy force. Lessons were drawn from a full range of operations from combat support to humanitarian missions. Three basic issues characterize the resulting trend analysis:

1. Lack of functional expertise required for safe operations and force protection
2. Lack of sufficient planning and/or information leading to inefficient deployments
3. Unforeseen conditions disrupting effective deployment execution

Although none of these conditions noted resulted in loss of life, they were submitted and validated in order to point out unsafe or inefficient operations that, given the wrong set of circumstances or an aggressive adversary, might have resulted in tragedy. They represent the type of risks that might not be readily apparent in the large scheme of operational planning. Each case was the result of inefficient planning, oversight, or a deliberate decision to prioritize combat equipment ahead of combat support despite the operational constraints imposed by the omission in terms of deployment efficiency and or need for operational flexibility.

Force Protection

Engineers provide force protection capabilities to a commander in an expeditionary environment ranging from explosive ordnance disposal to fire fighting and rescue activities. They also implement defensive measures including secure siting, assembly, and hardening of facilities used for force beddown. A primary responsibility for the first engineers deployed, learned from past losses and successes,[11] is to protect high value resources by building revetments, berms and barriers. A major role for Air Force military engineers is to coordinate chemical/biological defense and decontamination efforts. Force protection also extends to the assurance of a safe water supply. Given these force protection responsibilities, the deployment of combat power into a location with an unknown or even minimal threat of attack, without the capability to protect the force, exponentially increases the risk to forces.

In the initial days of DESERT SHIELD, Gen Pagonis noted a force protection nightmare of "*5,000 soldiers sleeping at Dragon base, a Saudi facility designed to accommodate 200 personnel and their families. 10,000 Bedouin tents set up around the Dhahran AB airfield. Another facility designed for 100 people and occupied by 1,000. All expecting 100,000 Republican guard to attack at any minute.*"[12] Had the U.S. initially deployed a combat service support element trained in reception, staging, onward movement and integration (RSOI), the arrival and dispersal of the 82nd might have been more secure. In current operations we are learning the same lessons. At a location in a northern country, site selection for a force

[11] Bien Hoa, South Viet Nam, May 1965 – "Large numbers of AF strike aircraft were deployed to bases where pavement for parking was at a premium. Aircraft were parked wingtip to wingtip and were vulnerable to an accidental explosion or enemy attack. When a bomb [on a parked B-57] accidentally exploded…. Resulting explosions destroyed 40 unprotected aircraft and killed or injured over 100 people." Ronald B. Hartzer, "Air Force Civil Engineers: Building Air Power's Foundation," Engineer, (August 1995), 30.
King Fahd Airfield, Saudi Arabia – "A parked A-10 accidentally fired a missile, striking a revetment wall. The wall stopped the missile and prevented damage to aircraft nearby."- Gulf War Air Power Survey, 26.

beddown by non-engineer personnel failed to investigate soil conditions, resulting in the first deployed forces being sickened by toxic waste fumes and pesticide contamination.

The risk to forces and assets from the absence of engineers is not confined to the initial days of a deployment, but to the commencement of operations as well. One critical function with a recurring theme of deployment problems is emergency services. In DESERT SHIELD: "*Beddown of firefighters should take place before arrival of aircraft. However, in August and early September, aircraft sometimes preceded adequate fire services. At Cairo West, for example, few firefighters and no vehicles were available for the first two weeks, and this was true to varying degrees at other sites.*"[13] In DESERT STRIKE: *"Observation: At bomber deployment location, there was no EOD capability and fire/crash rescue capability was questionable. Lesson Learned: Lack of proper EOD or fire/crash capability leaves potential for serious problems. For example, C-17 was grounded in Bosnia for hung flares because no EOD capability had been planned*"[14] This theme continues in current operations where fire fighting and EOD manning at many locations does not meet operational requirements.

Force protection through water purity, sanitation, and hygiene is another recurring theme. During DESERT SHIELD, *"Jeddah AB experienced four separate FBI's [food borne illness attacks] attributed to food prepared in off-base facilities. One case affected 648 personnel during the air war. Contaminated ice used to cool canned drinks as the culprit in two outbreaks at Bateen and Al Dhafra*."[15] – In current operations at a location in a northern bordering country, initially deployed personnel including pilots have been stricken with skin rashes

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Afghanistan AOR - "C-5's, which date to 1970, have clogged runways as they've broken down. At one base planners had estimated they'd need room for up to eight C-5's on the ground at once. A spate of breakdowns left the tarmac littered with 22." - "Keeping the Birds Aloft," U.S. News and World Report, (November 12, 2001), 36

[12] Pagonis, 96

[13] Gulf War Air Power Survey, 14.

[14] JULLS Report Number 91477-95740, 12 Sep 96

[15] Quoted in Gulf War Air Power Survey, 18.

(illustration 2), folliculitis and other ailments from unsanitary conditions and untreated water.

The absence of Air Force engineers for the critical function of runway repair and maintenance is causing deployment delays. At an Afghani location, rapid runway repairs were initially tasked to a civilian contract due to the absence of Air Force engineers. When repairs to the cratered runway failed under the stress of the first few passes by a C-17, U.S. Army personnel re-accomplished the repairs. After the second round of failed repairs, Air Force engineers trained for the task were deployed to complete the task. The inefficient use of resources delayed full operational capability of the airfield by two weeks and risked high value strategic assets. On the positive side the Navy's decision to deploy engineers along with Marines into Camp Rhino paid dividends in the first days. '*The reason Marines were able to get in there was because after every C-17 landed and broke up the runway, we had a group of Chuck Kubic's Seabees that would run out there and fill up the ruts so we could get another C-17 in with light armored vehicles on it….*" [16]

A similar lesson using contractors for initial force beddown functions was identified in previous operations in Bosnia and Kosovo [17] highlighting concerns about contractor performance in an austere forward location with a validated threat. Planners adhere to doctrine [18] by using contractors to offset sacrifices in forces and equipment deployments. But,

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[16] Marine Brig Gen John Castellaw, Deputy commander of Marine Forces Pacific, as quoted by William Cole, "Navy Engineers Ingenuity Brighten up Kandahar" Honululu Advertiser, (January 28, 2002), 1

[17] "Observation: The logistics Civil Augmentation Program (LOGCAP) was tasked to provide the initial camp preparation and construction in support of TF Eagle during OJE. The USAREUR engineer vertical construction capabilities had been lost (largely to the Reserves)…Because of funding delays and thirty day start-up times (to hire locals, etc) LOGCAP could not meet the required deadline. Therefore, military engineers from other Services (USAF RED HORSE, USN SEABEE) had to be deployed at the last minute to start camp construction for initially deploying units. Lesson Learned: Do not use LOGCAP as the initial engineering capability in a contingency deployment. Instead, use active duty military engineers as the entry units for any new, time-sensitive operation. Recommendation: Adjust contingency plans to bring in active component military engineers as the initial capability…. follow-up engineering capability can then be provided by a combination of active component, reserves, or LOGCAP." – JULLS 71244-69732, 9 Mar 98.

[18] "Goals of Civil Augmentation Programs: Plan during peacetime for the effective use of contractor support in a contingency or crisis; Leverage global and/or regional corporate resources as facility and logistics force

planning for contractors to satisfy beddown requirements in lieu of deploying military forces presents a new level of risk to the field commander. Reliability issues and limited command and control impact force protection and sustainment operations and might require that a commander compensate for the risk by using military forces as back-ups, an inefficient way to ensure the job gets done. Despite extensive use and many successes in Bosnia and Kosovo [19] nagging concerns persist about the additional risk incurred by field commanders in areas of:

- Contractor readiness (no measures of preparedness – no testing or exercises)[20]
- Guarantees for performance regardless of threat[21]
- Commander flexibility – Contract can limit command and control flexibility if it becomes the controlling factor. Requires expertise to manage contracts
- Protection of contractors – classified as noncombatants
- Lack of redundancy – With contractors responsible for providing supplies on the battlefield, there will be no trained force structure capable of handling this function
- Value – most effective use of resources or avenue for savings?
- Host nation relations – contractor employees not able to be controlled or restrained in off base interactions
- Security – Local labor/contractors may not have background checks[22]

Numerous articles and papers provide a comprehensive review of risk associated with the use

multipliers; Provide an alternate augmentation capability to meet facility and logistics services shortfalls; Provide a quick reaction to contingency or crisis requirements" - Joint Pub 3-35,VI-6

[19] Reviews of positive effects provided by Herman Palmer, "More Tooth, Less Tail: Contractors in Bosnia", Army Logistician, (September/October 1999), 6-9, David Wynn, "Managing the Logistics-Support Contract in the Balkans Theater," Engineer (July 2000), 36-40, and George Cahlink, "Army of Contractors," Government Executive, (February 2002) 34-38

[20] In Joint Endeavor: US Army contractor failed to provide materials necessary to offload aircraft or upload outbound trucks despite contractual requirements. This required extensive assistance from the deployed aerial port. Comment: Similar issue already forwarded to USTRANSCOM. – JULLS 62950-05100, 25 Jan 96

[21] DoD IG noted in 1991 "If contractors leave their jobs during a crisis or hostile situation, the readiness of vital defense systems and the ability of the armed Forces to perform their assigned missions would be jeopardized."

[22] "One soldier said the use of local contractors for some of the construction also meant that intelligence might be leaving the base every day and could reach terrorists." C.J Chivers. "U.S. Strengthens Security at Borrowed Uzbek Air Base," New York Times, 10 November 2001, B2.

of contractors at forward locations.[23] Unwritten policy among the Services deploys military engineers initially into an expeditionary location to establish operations, (using contractor supplied equipment if possible) and then to turn base operating support and maintenance over to a contractor. This sequence ensures a full initial capability and less risk in the transfer of functions once the commander is certain the contractor is ready.

In all, operational planners must remain cognizant of the risk to the ability of commanders to protect forces incurred by the delay or omission of key military engineering functions from the first deployment stages.

Effective Deployment Execution

> *"Logistics as a factor in determining objectives; Depending on the theater operations and logistical concepts that a geographic combatant commander employs in a campaign, logistical factors will almost always affect a theater campaign and exert different constraints. Logistics is a positive enabler to the execution of successful operations. Good logistic synchronization is a combat multiplier. Strategically, logistic capabilities may limit the deployment concentration and employment options. Operationally, theater logistic constraints may dictate the rate of strategic build-up or theater onward movement, overall composition of the combat force, and the depth, tempo and duration of combat operations. Tactically, the logistics initiatives at the strategic and operational levels must be focused on ensuring that the right support at the right place at the right time."* (Joint Pub 4-0, II-4)

The second area of risk incurred is the delay in initial operating capability due to incomplete plans or the disruption of the flow of forces into an expeditionary environment. While not as severe a risk to operational success as force protection, the risk of inefficiency puts substantial strain on limited lift resources and limited time as illustrated in the Gulf War.

> *"The deployment and use of airlift, particularly in the early days, was anything but well executed. Little information was available to deploying units about their*

[23] See Kim Nelson, "Contractor Support on the Battlefield - Risky Business" Air Force Logistics Management Agency, (Jan 2001) 76-85, Eric Orsini and Gary Bublitz, "Contractors on the Battlefield – Risks on the Road Ahead? Army Logistician, (January/February 1999), 23-29, and Susan Foster, "Contractors on the Battlefield: Force Multipliers or Detractors?" (Unpublished Research Paper, U.S. Army War College, Carlisle Barracks, PA, April 1998)

> *possible beddown bases. Several locations were newly built, and others were bare bases. Changes to beddown bases further complicated unit deployment preparations and airlift prioritization. Beddown changes resulted from host nation sensitivities, ramp congestion, and mismatches between aircraft, munitions, and support equipment*." [24] *"A squadron of F-16 C/Ds from Shaw AFB had its destination changed in mid-flight from Sharjah to Al Dhafra in the UAE. The squadron arrived on 10 August; another followed on 11 August. While the two squadrons were soon declared combat ready, they were short on air-to-ground munitions, corrosion prevention fuel additives, materials to build living quarters and squadron facilities, and drinking water. Concerned over the conditions at Al Dhafra, General Olsen [CENTAF Deputy Commander] instructed his logistics planners to send a Prime BEEF team there immediately. He delayed arrival of additional people and equipment while expediting two C-141's and sixteen C-130's carrying Harvest Falcon assets. Due to uncertainty over other beddown locations, and to give MAC time to finish missions supporting earlier deployments, CENTAF also delayed additional unit departures for three days*".[25]

In many cases, flow of combat power has been interrupted to correct discrepancies in the balance of combat support elements. The absence of critical airfield support skills in previous operations threatened to halt strategic airlift operations.[26] In a classic Catch-22, equipment needed to facilitate the deployment of combat forces was "out-prioritized" by the need to deploy combat forces. Another strain on strategic airlift affecting deployment efficiency is the continued perpetuation of "the logistics snowball" originally described in theory in 1959[27] and later verified in practice in 1990.

> *"Because CINCENT decided to deploy combat units ahead of logistics support and sustainment cargo, CENTCOM did not allocate airlift resources to channel operations…. Consequently, backlogs of sustainment cargo routinely built up at CONUS aerial ports. Compounding the problem was the fact that cargo caught in*

[24] Gulf War Air Power Survey, 4
[25] ibid, 125
[26] In Joint Endeavor: "Observation: All required forward operating base flight line support equipment was not in place when airlift operations commenced. Lesson Learned: Aircraft on runway needing a tow or deice, could have shut down operations. Lack of ability to clear snow from runways could have shut down operations. Recommended action: Ensure priority of flight line infrastructure is high and in place prior to airfield operations commencing. Comments: Priority of equipment movement into B-H was determined by theater CINC. Some support equipment was "out-prioritized" by combat equipment." – JULLS 11441-62300, 14 Jan 96
[27] "If the logistics aspects of an operation are initially planned and provided on a seriously inadequate scale, experience has shown that the eventual commitment of logistical resources to that operation, in an effort to correct the initial deficiencies, will be lavish and wasteful. In other words, *under-planning* produces *over-planning*… The problem of the relative build-up of combat forces versus logistic forces is largely a problem of personnel; and inefficient personnel is the single greatest source of the "logistics snowball". (Eccles p 52.)

the backlogs was often assumed lost and subsequently reordered."[28]

In ENDURING FREEDOM the lack of adequate surveys or advance deployment teams to locations never previously considered for operations has resurrected the same dilemma of under-estimated airlift requirements as was noted in the first few days of DESERT SHIELD.[29] Despite vast improvements in transit visibility since the Gulf War, the absence of a logistics team in place to receive and distribute equipment and material accompanying combat forces will eventually increase the total requirement for airlift resources. Another requirement levied on intra-theater lift has been the movement of personnel from one forward location to another to compensate for inadequate flow into the theater. In current operations critical skill engineers have had to be transported between forward locations to ensure safe operations. A balanced sequence of incoming forces places the right personnel in the right place at the right time and can improve overall efficiency while reducing the risk of combat power employment.

Assessing Courses of Action

> *"The JFC's concept of logistics is a key part of the integration and synchronization of the joint effort. Through the logistics concept, JFCs enable the deployment, entry, build-up, application, sustainment, reconstitution, and redeployment of joint forces. JFCs identify and reinforce priorities between combat and logistical requirements. Logistical considerations are key to the Commander's estimate process, will greatly impact on the development of courses of action (COA), and may dictate COA selection… The potential impact of national, host nation, and international environmental laws, regulations, conventions, and treaties on deployment operations should be considered early in the planning process. The requirements may have an impact on POE and/or POD selection and management of SA's and other deployment decisions."* (Joint Publication 3-35, III-13)

The commander's assessment of the situation, to include analysis of conditions, commander's intent, and the identification of governing factors, is an essential part of the planning process

[28] Gulf War Air Power Survey, 302

[29] "As a result of requirements uncertainty, estimated airlift requirements for the first seven deploying units increased by sixty percent between 11 and 13 Aug" The increase forced the Command to schedule more sorties than originally planned for those units and to delay airlift for follow-on units."- Gulf War Air Power Survey, 83

for crisis response operations. Courses of action (COA) evolve from this estimate, which are then compared and assessed in relation to the mission objectives. A COA is then selected and transformed into a concept of employment and deployment plans. As Moltke noted, *"No plan survives first contact with the enemy.*" This observation was proven true in DESERT SHIELD[30], subsequent humanitarian operations[31], and remains true in current operations. One reason is that because deliberate planning quickly becomes crisis response planning (no matter the rigor of the plan), it is accomplished with little time to verify existing conditions or seek field commander input. CINCs select the course of action and planners develop a deployment order with priorities and risk assessment, assuming many variables in order to quickly match requirements with resources. Inevitably, reality does not match assumptions which then lead to disruptions, improvisation, and a flawed risk assessment. One way to reduce this friction is to accelerate "contact with the enemy." While combat support enables force protection and employment sustainment, they are also critical assets to validate courses of action. Putting small, mobile teams on the ground first at expeditionary locations to verify existing conditions, estimate capabilities, and perform preliminary planning can be a valuable source of information for planners to accurately determine the risk associated with certain courses of action. In addition they are a much easier element as compared to combat forces to move or extract from a location if local conditions cannot support the mission assigned.

*"**Conclusions**: It is self-evident that the practical application of a strategic concept requires very specific deployments and tactical operations. The study of ancient and modern wars and of current crises shows that these deployments and tactical operations must be preceded by specific logistic action. This consists first of an economic-logistics build-up to create the combat forces, and second the further very specific logistic deployment to support tactical operations. This vital relationship requires that strategic, logistic, and tactical planning and control be completely integrated in the mind of command." - ADM* Eccles, 316

the Great Lakes region of Africa, there was still a last minute rush to accomplish needed airfield surveys and flight checks that were critical to safe operations. Lesson Learned: Getting eyes on the ground before any substantial flow started alleviated any major problems with planning information not matching reality. Recommended Action: Base Operating Support (BOS) planners should be included on survey teams. " JULLS 11745-44991, 3 Jan 97

What Does Doctrine Say?

U.S Joint Doctrine gives the combatant commander ultimate responsibility for risk assumed at all levels within the theater of operations. Responsibilities and risk management for logistical support is less clear. Joint Logistics Doctrine implements a policy of Single Service Logistical Support in expeditionary operations, *"Each Service is responsible for the logistical support of its own forces,"*[32] directing Components to manage the material support as well as sequencing of force deployment. But, the same joint publication *"gives combatant commanders authoritative direction over all aspects of logistics necessary to accomplish the mission. Within their commands, combatant commanders use this authority to ensure effectiveness and economy in operations. Combatant commanders ensure that the concept of logistics supports the concept of operations."*[33] In consideration of constrained resources strategic airlift, sealift, and competing national interests, this authority ensures the combatant commander has the greatest freedom of action allowable by resource availability. But then, limitations are imposed. *"A CINC's authority does not diminish the Services' responsibilities to provide support to their own forces. While a CINC's authority is generally confined to the theater, logistical support beyond the theater is usually a Service responsibility."* [34] This direction does not provide definitive guidance on the prioritization of functions flowing into a theater and is further complicated by direction that *"A CINC will exercise approval authority over service logistical programs (base adjustments, force beddowns) within the command's AOR that will have* ***significant effects on operational capability or sustainability."***[35] The result is a lack of accountability for the ultimate expertise required to conduct a responsible risk assessment of the impact to operations from force deployment sequencing and priorities.

[32] Joint Pub 4.0, I-7
[33] Ibid, I-3
[34] Ibid, I-4

> *"Finding the proper balance between projecting the force rapidly and projecting the right mix of combat power and material for the ultimate mission is critical. The commander must seek a balance that provides protection, efficient deployment, adequate support, and a range of response options to enemy activity. The availability of mobility assets is most often a constraining factor, so difficult trade-off decisions continuously challenge supported commanders."* [36]

So What?

Given the range of responsibilities assigned to a commander in a contingency, the risk of an inefficient operation or a potential incident due to a missing function might not rate high on the "CINC concern" meter. A situation constrained by resources and time demands that cost/benefit trade-offs be assessed very quickly at all levels of planning. Hard decisions are made on the timing of ready effects. An absent firefighter might decrease pilot rescue capability, or the inability to clear a runway might cost an engine or even a sortie. But, in a contingency environment in austere conditions where the goal is to put iron on targets, a degree of inefficiency gets rolled up in the fog and friction of war. Each operation generating lessons learned was ultimately successful. In all the lessons noted, no one lost a life. Smart field leadership, adaptability, and improvisation stepped in to keep the operation moving towards mission success. If missions are successful, why criticize their execution?

Winston Churchill referred to the large logistical tail of the British Army in WWII as "fluff and flummery," insisting on less fat, more muscle.[37] Defeating the enemy was the objective and the employment of combat forces was the strategy. But British commanders in the field at every echelon continued to consistently request more support troops. The same lesson has been repeated in every conflict. If we continue to use the same processes from the last war, eventually, an enemy will take advantage of the vulnerability, inefficiency, and confusion.

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[35] Ibid, I-7
[36] Joint Pub 3-35, III-3
[37] As quoted by Martin Blumenson, "The Emergence of Infrastructure as a Decisive Strategic Concept," Parameters, (Winter 1999-2000): 39-45

So what is the risk of deploying support functions ahead of combat power? CINC staffs would be faced with similar issues of force protection, the probability of a delay in the date of initial operating capability, and a threat to the achievement of objectives. Immediate force protection concerns can be most pressing in the time between the first arrival of forces and the closure of combat capability. This window of vulnerability would be extended by the introduction of support functions first into an expeditionary location. As to delays in capability, CINC's want to know the day they can employ effects. The later that capability date, the greater risk to satisfaction of objectives and the greater the pressure on components to make deployments priorities. The ability to affect the enemy must be the top priority over efficiency and flexibility.

In a hostile environment, security is the first requirement for an expeditionary location and dominates deployment priorities. This is why assault forces such as the 82nd Airborne and Marine units are the force of choice for hostile environments such as Kandahar and Kabul. But in most Army and Air Force operations involving the establishment of operating bases, only secure areas such as Uzbekistan and locations North were considered for the beddown of forces and assets. This requirement immediately mitigated the risk of force protection.

The remaining point in the delay of capability must be assessed at each stage of deployment. In a current operating theater predominated by entry and resupply from the air, lines of communication necessitate a depth of analysis. Will the initial deployment of support functions "open the pipeline" for a quicker subsequent deployment of combat forces or will a faster initial arrival, but a slower closure of combat power, satisfy the mission objective? Does the concept of operations require the partial application of power with a gradual build-up? These questions get back to the need for a comprehensive risk assessment and the commander's intent.

Recommendations

A crisis response plan should be as efficient and comprehensive as possible to maintain the attention and effort of fielded forces at a forward location towards employing power and expanding capabilities to respond to new situations. Each lesson learned, from thousands of airborne troop around an exposed runway threatened by an enemy nearby to forward personnel rife with sickness through the local water supply, represents a vulnerability that may eventually be used against us by a willing enemy. Over the past twenty years, more U.S military personnel have died from enemy and terrorist attacks against sustainment facilities and operations, (i.e. barracks, recreation facilities, replenishment) as have occurred during combat operations. These recommendations are intended to contribute to a comprehensive risk assessment process to analyze and select the best courses of action the first time. While they focus on the roles of military engineers, they can be applied to the entire spectrum of logistical support.

Training and Expertise

From Panama[38] to DESERT SHIELD and beyond, theater CINCs have been haunted by changes in operational plans and courses of actions due to dynamic, unforeseen, or overlooked aspects of force sustainment and logistics. Reasons have ranged from Host Nation sensitivities and differing site conditions to availability and access to resources. A joint logistician in supporting the planning cell must research, analyze, and be able to recommend options in a very short amount of time on a spectrum of activities ranging from host nation support, viability of contract support, lines of communication, force sustainment requirements for varying levels of operations tempo, availability of pre-positioned assets, and combat support

[38]Col James Steele, Commander of U.S. Military Support group for Panama noted, "Initially, we had problems with the J-4, because some of its personnel were not competent enough. The J-4 was involved in a lot of projects and we needed people who were not only competent, but also very attentive to detail, because there were a number

capabilities desired to effect maneuver and offensive operations - for all Services - and coalition partners - with a limited amount of strategic lift assets. The result can quickly be task saturation and lesser degree of rigor in the details. CINC staffs manage these requirements by both delegating to each component deployment prioritization responsibilities and apportioning a predetermined percentage or tonnage of strategic airlift per day. This process allows a greater degree of functional expertise to be applied to the prioritization process.

Problems arise when component planners must justify a request for additional airlift, or defend the use of existing airlift to the JTF or CINC planning staff. Comprehensive expertise across all functional areas is necessary, or must be available, to provide counsel on the degree of risk incurred or the effects on operations from a change in the proposed sequence. They must know what critical functions, from refuelers and munitions loaders to fire fighters, are required and be able to defend when they must be deployed in order to effectively employ combat power. One recommendation would be to establish a joint functional cell for the CINC with the expertise to manage decisions for all Services, for example a Joint Engineer to coordinate all assets and resources in the theater. Also, depending on the situation, logistical expertise does not necessarily need to be centered in the J-4 function[39]. A clarification in doctrine should ensure that the command level vested with authorization to determine the sequence of functions has access and expert counsel to an adequate assessment of the entire spectrum of risk associated with the sequencing and its impact to mission success.

CINC and component staffs must have experts that are sufficiently trained on the full range of capabilities and requirements within their functional areas, as well as the correlation to local

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of restrictions on these activities" - quoted in Richard H. Shultz, In The Aftermath of War (Maxwell Air Force Base, AL: Air University Press, August 1993), 36

[39] Anthony Vesay proposes positioning engineers under the J-3 for operations where base operability will have a primary impact on mission accomplishment and J-4 for operations where engineers support logistics and under the

conditions to be able to accurately advise Commanders on proposed courses of action and their risks.[40] Options range from an intense two-week formal training regimen for each functional area on a joint or component planning staff to a plan to augment staffs with properly trained experts. A training program should also include AOR familiarization, whether through tours of selected countries, interaction with U.S Embassy MILGROUP personnel, or temporary duty. The goal should be the application of logistical expertise and training across all operational planning and execution phases to provide a breadth and depth of combat support to the CINC.

> *"The commander must understand the cause and effect relationships which exist in logistics in order that he may estimate how the gain or loss of efficiency in any particular technical function will influence the efficiency of the other functions which in combination determine his overall combat effectiveness"*[41]

Use of All Available Resources

Previously conducted airfield surveys, host nation interaction, and emerging database technologies like GEOREACH[42] and LOGCAT[43] offer sources of critical information needed in crisis planning. They can offer a quick first glimpse of key infrastructure and capabilities to assist with the development of courses of action and employment concepts. But even the most updated sources require verification if they are to used as facts in a risk assessment. The most effective method to ascertain the capabilities of a potential forward operating location is to put a team on the ground as quickly as possible. Putting expert cross-functional eyes on the ground at forward locations in communication with planners and deploying force commanders ensures

JTF commander where engineering operations will dominate the mission (such as earthquake and hurricane relief) Anthony Vesay, "Joint Engineer Training – Top Ten Lessons Learned" Engineer (April 1999), 15

[40] An excellent review and proposal to establish an integrated logistics school for component logistics commanders and staffs is: J. Reggie Hall, "Expeditionary Airpower – The Need for an Integrated Logistics School" in Today's Logistics, ed. James Rainey, 106-120. Maxwell; AFB AL: Air Force Logistics Management Agency, May 2001

[41] Eccles, 317

[42] Database uses satellite imagery and contextual analysis to determine local conditions for an expeditionary location

[43] Logistician's Contingency Assessment Tools - A SIPR-NET-based suite of automated system capabilities developed by the U.S. Air Force to aid with expeditionary site planning.

continuity in prioritization of deployment and tailoring of assets.[44] Whether elements of the deploying force or a separate team (proposed composition at Table 1, pg 28), their eyes on target can accelerate initial operating capability for combat power. If deployed early enough and in contact with theater and component planning staffs, they can provide critical information and/or facilitate contractor support, host nation agreements, and eventually deployment reception. These services could then tailor equipment and material flow, thus reducing the amount of airlift required. This method has worked in previous operations,[45] is being used at a few locations currently and should serve as the model for future operations. Except when forced entry is required, units critical to the throughput of follow-on forces should be deployed first. Determining ahead of time when support functions are actually required in relation to the arrival of combat forces would greatly reduce uncertainty in a risk assessment.

Commander's Intent

While future operations may require the quick decisive deployment of combat power to deter or defend against an attack, not every situation will require the forty-eight hour

[44] Observation from Gulf War: "CENTAF contracting began to deploy contingency contracting officers ….one or two days before the arrival of incoming units. These personnel established blanket Purchase agreements for [many services and items available] on the local economy. Such foresight helped keep airlift assets concentrated on supplying units with warfighting capabilities…" Gulf War Airpower Survey, 57

[45] Maj General Brady commanding the 16th Aerospace Expeditionary Task Force in Kosovo observed "A thorough analysis of the deployed location and the organizations as well as the people and equipment required to support operations, is the first step in a successful operation. And this important analysis will require close communication among the deploying unit, the unit's major command and the theater air component…. The Commander should proceed to the expeditionary base as soon as possible. This is extremely important in expeditionary operations, particularly when base operating support is not available and there are no US host units to establish relationships with host nation officials. We gained a distinct advantage by have him (4 AEW Commander) arrive well before the aircraft. It allowed time…to begin discussions on some of the more important issues of force protection, contracting with local vendors, and so forth. In addition, early arrival gives the commander time to focus on all the important aspects of base operating support before operations begins... **Lessons Learned**: we need to formally establish the process by which we determine the make-up of units being deployed to expeditionary locations. Even though commanders should retain the authority to form their units, the theater air component is best positioned to advise commanders in what resources are available at deployed locations and what should be brought forward from CONUS. More definitive guidance in War Mobilization Plans volumes and exercise predeployment discussions with the theater air components are both required to ensure the best use of limited lift resources and more effectively manned and equipped expeditionary units." Roger Brady, "Building and Commanding Expeditionary Units – Lessons from Kosovo" Aerospace Power Journal (Spring 2000), 20

deployment of an Air Expeditionary Force to forward locations. Questions of intent are "When does the CINC need sustained effects?" and "What risk to forces is the Commander willing to assume to gain the effect?" How high a priority should Gen Schwarzkopf's guidance in 1990 - *"to take care of the troops; make sure they are getting everything they need. If you don't get that done, nothing else counts"*[46] – be in relation to the employment of combat power?

If any time exists between a deploying order and the need for initial operating capability, that time should be used to improve efficiency and protection of forces by qualifying requirements and quantifying resources at forward locations. Feedback to the CINC and component staffs should concentrate on three categories: Operational feasibility/limiting factors; logistical constraints/work-arounds; and force laydown/engineering requirements. The decision when to deploy combat support elements also depends on if and when a commander wants the capability to respond to a changing environment. For both, a comprehensive risk assessment should include a probability with a high degree of assurance on a range of questions ranging from the threat to anticipated follow-on missions. Table 2 (page 29) provides a general framework of the factors to be assessed. The higher the probability of the requirement or the even higher the degree of uncertainty about the requirement should drive a need for either further investigation or the deployment of support elements first to establish a clear understanding of the environment in which we will deploy combat power. A commander should know the full range and extent of possible hazards his decisions will impose upon his forces to ensure adherence with his intent.

"***Balance between Combat Forces and Logistics Forces***. *The aim of any military organization is to produce the greatest possible combat power with resources available. The balance at the beginning of hostilities is especially important. Fully trained and equipped combat support elements must be available and deployed early enough and in adequate numbers to render immediate sustained support to combat troops. A combat force without logistic support is immobile and powerless"* (Joint Pub 5-00.2, Joint Task Force Planning Guidance and Procedures, 13 January 1999, VIII-4) or "*is not sustainable and may not be fully capable of mission success*." (Joint Pub 4-0, II-2)

Conclusion

U.S. Joint Military Doctrine specifically gives warfighters the maximum degree of operational flexibility and freedom to develop a course of action to satisfy the national security objective. Within this freedom is the responsibility to accurately assess the risks and benefits to be gained from each aspect of the operation. In order to make an accurate assessment, commanders rely on their staff for analysis, expertise, and recommendations to establish priorities for force employment. The sequencing and balance of functions has repercussions and risks that commanders and their staffs should consider in comparison to force protection and deployment deficiency considerations. By understanding lessons learned, trends, and recommendations to improve the safety, security, and efficiency of combat power deployments in an expeditionary environment, commanders can employ a more capable and secure force from the first order. Fortunately, no matter the conditions and circumstances our soldiers are given, they have always and will continue to find a way to successfully complete the mission.

Illustration 1 – Typical USAF Engineering Functions

Typical USAF Engineering Tasks

- Emergency repairs to facilities and infrastructure
- Fire protection, ground crash egress/rescue and fire suppression
- Explosive Ordnance Disposal
- NBC protection, detection, and recovery
- Preparation of runways, arresting barriers, lighting, navigation aid installation
- Utilities (power generation, distribution, well drilling, water treatment and storage)
- Beddown planning, site prep, assembly of facilities and infrastructure
- Road and access construction
- Establishment of ammunition storage areas, fuel storage and distribution
- Passive Defense (berms, fences, revetments, facility hardening)
- Environmental protection, sanitation concerns and climate control
- Clearing of ramps and aprons of debris and natural material (sand, dirt, snow)
- New construction as required
- Base Operation and Maintenance
- Demolition and Facility/infrastructure Denial

Air Force Civil Engineer Support Agency Pavement Evaluation Team members obtain a core sample from a runway. The team has been in Southcentral Asia since Oct. 21 evaluating dozens of airfields for potential use in support of Operation Enduring Freedom

People from the 86th Expeditionary Contingency Response Group worked together to build a tent city at Manas International Airport in Bishkek, Kyrgyzstan. The 86th CRG, based at Ramstein Air Base, Germany, is deployed here to set up an airfield for coalition forces supporting Operation Enduring Freedom

Table 1– Proposed Composition of Advance Deployment Team

	Specialty	**Tasks**
1	Installations or Logistics	Team Chief (from component command)
2	Logistics Plans	Team coordinator and component planning staff liaison
3	Operations Plans	LIMFACS, Airfield management, Host Nation Interaction
4	Airlift Operations	LIMFACS, MOG, Parking, off-load
5	Airlift Logistics	MHE requirements, pallet holding area
6	Aircraft Maintenance	Facility support, location,
7	Munitions Maintenance	Storage and transportation
7	Weapons Safety	Explosives siting, distance zoning
8	POL	Storage, distribution, quality
9	Civil Engineering	Pavement Assessment
10	Civil Engineering	Force beddown planning- material acquisition
11	Civil Engineering	Utility assessment (power, water, sanitation)
12	Contracting	Warrant authority - Local services and material support
13	Communication	Location connectivity
14	Communication	Aircraft control capability
15	Security	Force protection and perimeter security
16	Medical Services	Bio-environmental engineer – testing ground and water
17	Services	Availability of local resources
18	Weather	Availability of local resources
19	Transportation	Availability of local resources
20	Admin	Support
21	Admin	Support

Table 2 - Factors to Consider in the Prioritization of Functions

The higher the probability, the higher the risk is in flowing combat forces first into an expeditionary location and commencing operations before closure of support elements

Threat assessment
Probability of attack on base
Chemical/Biological threat
Requirement for operational security
Need for antiterrorism measures (i.e. passive defense, CCD)
Limited use of local labor due to force protection concerns
Probability of unexploded ordnance and requirement for disposal

Environment
Adverse climate/conditions impacting base operations and force sustainment
Terrain (i.e. site preparation, drainage and sewage disposal)
Existence of hazards (i.e. snow, ice, dirt, dust)
Compliance with environmental law
Threat to local natural resources
Existing soil /water contamination

Local Conditions
Reliability of airfield survey (age, probability of change)
Reliability of local utilities (power, water)
Quality of existing infrastructure construction
Availability of contractor support and services
Depth of skilled labor pool
Availability of materials (quality, amount, access, timing)
Contractor performance and reliability
Access to prepositioned assets (HF/E, Force Provider)

Mission Requirements
Surge Sustainment /operational tempo - strain on infrastructure
Trained personnel for airfield firefighting, crash/rescue, and aircraft egress
Degree of flexibility required for mission changes (aircraft parking, beddown, munitions, host nation concerns)
Requirements for a hospital
Lines of communication (i.e. runway sole means of resupply?)
Planned length of Base Operating Support
Anticipated end state? Temporary to permanent
Possibility for refugees, non-combatants, and prisoners/detainees
Objectives in humanitarian missions (local transportation, debris removal, utility restoration, construction, etc)

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